

SEQUENCE LISTING

5 <110> Michel, Albrecht
 Scheffler, Brian E.
 Netherland, Michael D.
 Dayan, Franck E.
 Arias de Ares, Renee S.

10 <120> HERBICIDE-RESISTANT PLANTS, AND POLYNUCLEOTIDES AND
 METHODS FOR PROVIDING SAME

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50	Gln	Arg	Ser	Pro	Ile	Glu	Gly	Phe	Tyr	Leu	Ala	Gly	Asp	Tyr	Thr	Lys
			515					520					525			
	Gln	Lys	Tyr	Leu	Ala	Ser	Met	Glu	Gly	Ala	Val	Leu	Ser	Gly	Lys	Leu
		530					535					540				
	Cys	Ala	Gln	Ala	Ile	Val	Gln	Asp	Ser	Glu	Leu	Leu	Ala	Thr	Arg	Gly
	545					550					555					560
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 Met Asp
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35 act ggc tgc ctg tca tct atg aat att act gga gct agc cag aca aga
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 Tyr Thr Ser Phe Ala Val Lys Lys Leu Val Ser Arg Asn Lys Gly Arg
 35 40 45 50

50 aga tca cac cgt aga cat cct gcc ttg cag gtt gtc tgc aag gat ttt
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 Arg Ser His Arg Arg His Pro Ala Leu Gln Val Val Cys Lys Asp Phe
 55 60 65

55 cca aga cct cca cta gaa agc aca ata aac tat ttg gaa gct gga cag
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 Pro Arg Pro Pro Leu Glu Ser Thr Ile Asn Tyr Leu Glu Ala Gly Gln

	70	75	80
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5	644 Leu Ser Ser Phe Phe Arg Asn Ser Glu Arg Pro Ser Lys Pro Leu Gln	85 90	95
	gtc gtg gtt gct ggt gca gga ttg gct ggt cta tca aca gcg aag tat		
10	692 Val Val Val Ala Gly Ala Gly Leu Ala Gly Leu Ser Thr Ala Lys Tyr	100 105	110
	ctg gca gat gct ggc cat aaa ccc ata ttg ctt gag gca aga gat gtt		
15	740 Leu Ala Asp Ala Gly His Lys Pro Ile Leu Leu Glu Ala Arg Asp Val	115 120	125 130
	ttg ggt gga aag gta gct gct tgg aag gat gaa gat gga gat tgg tac		
20	788 Leu Gly Gly Lys Val Ala Ala Trp Lys Asp Glu Asp Gly Asp Trp Tyr	135 140	145
	gag act ggg ctt cat ata ttt ttt gga gct tat ccc aac ata cag aat		
25	836 Glu Thr Gly Leu His Ile Phe Phe Gly Ala Tyr Pro Asn Ile Gln Asn	150 155	160
	ctg ttt ggc gag ctt agg att gag gat cgt ttg cag tgg aaa gaa cac		
30	884 Leu Phe Gly Glu Leu Arg Ile Glu Asp Arg Leu Gln Trp Lys Glu His	165 170	175
	tct atg ata ttc gcc atg cca aac aag cca gga gaa ttc agc cgg ttc		
35	932 Ser Met Ile Phe Ala Met Pro Asn Lys Pro Gly Glu Phe Ser Arg Phe	180 185	190
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40	980 Asp Phe Pro Glu Thr Leu Pro Ala Pro Ile Asn Gly Ile Trp Ala Ile	195 200	205 210
	ttg aga aac aat gaa atg ctt act tgg ccg gag aag gtg aag ttt gca		
45	1028 Leu Arg Asn Asn Glu Met Leu Thr Trp Pro Glu Lys Val Lys Phe Ala	215 220	225
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50	1076 Ile Gly Leu Leu Pro Ala Met Val Gly Gly Gln Pro Tyr Val Glu Ala	230 235	240
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55	1124 Gln Asp Gly Leu Thr Val Ser Glu Trp Met Lys Lys Gln Gly Val Pro	245 250	255

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 10 Phe Ile Asn Pro Asp Glu Leu Ser Met Gln Cys Ile Leu Ile Ala Leu
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 20 Gly Asn Pro Pro Glu Arg Leu Cys Met Pro Ile Val Asp His Ile Arg
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 1364
 25 Ser Arg Gly Gly Glu Val Arg Leu Asn Ser Arg Ile Lys Lys Ile Glu
 325 330 335
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 30 Leu Asn Pro Asp Gly Thr Val Lys His Phe Ala Leu Ser Asp Gly Thr
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 35 Gln Ile Thr Gly Asp Ala Tyr Val Cys Ala Thr Pro Val Asp Ile Phe
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 40 Lys Leu Leu Val Pro Gln Glu Trp Ser Glu Ile Thr Tyr Phe Lys Lys
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 45 Leu Glu Lys Leu Val Gly Val Pro Val Ile Asn Val His Ile Trp Phe
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 50 Asp Arg Lys Leu Asn Asn Thr Tyr Asp His Leu Leu Phe Ser Arg Ser
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 1652
 55 Ser Leu Leu Ser Val Tyr Ala Asp Met Ser Val Thr Cys Lys Glu Tyr
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1700
Tyr Asp Pro Asn Arg Ser Met Leu Glu Leu Val Phe Ala Pro Ala Asp
435 440 445 450
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gaa tgg att ggt cga agt gac act gaa atc atc gat gca act atg gaa
1748
Glu Trp Ile Gly Arg Ser Asp Thr Glu Ile Ile Asp Ala Thr Met Glu
455 460 465
10
gag cta gcc aag tta ttt cct gat gaa att gct gct gat cag agt aaa
1796
Glu Leu Ala Lys Leu Phe Pro Asp Glu Ile Ala Ala Asp Gln Ser Lys
470 475 480
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gca aag att ctt aag tat cat att gtg aag aca ccg aga tcg gtt tac
1844
Ala Lys Ile Leu Lys Tyr His Ile Val Lys Thr Pro Arg Ser Val Tyr
485 490 495
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aaa act gtc cca aac tgt gag cct tgc cgg cct ctc caa agg tca cct
1892
Lys Thr Val Pro Asn Cys Glu Pro Cys Arg Pro Leu Gln Arg Ser Pro
500 505 510
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Ile Glu Gly Phe Tyr Leu Ala Gly Asp Tyr Thr Lys Gln Lys Tyr Leu
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Ala Ser Met Glu Gly Ala Val Leu Ser Gly Lys Leu Cys Ala Gln Ser
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Ile Val Gln Asp Tyr Ser Arg Leu Ala Leu Arg Ser Gln Lys Ser Leu
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Gln Ser Gly Glu Val Pro Val Pro Ser
565 570
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 35 40 45
 Gly Arg Arg Ser His Arg Arg His Pro Ala Leu Gln Val Val Cys Lys
 50 55 60
 15 Asp Phe Pro Arg Pro Pro Leu Glu Ser Thr Ile Asn Tyr Leu Glu Ala
 65 70 75 80
 Gly Gln Leu Ser Ser Phe Phe Arg Asn Ser Glu Arg Pro Ser Lys Pro
 85 90 95
 Leu Gln Val Val Val Ala Gly Ala Gly Leu Ala Gly Leu Ser Thr Ala
 100 105 110
 20 Lys Tyr Leu Ala Asp Ala Gly His Lys Pro Ile Leu Leu Glu Ala Arg
 115 120 125
 Asp Val Leu Gly Gly Lys Val Ala Ala Trp Lys Asp Glu Asp Gly Asp
 130 135 140
 25 Trp Tyr Glu Thr Gly Leu His Ile Phe Phe Gly Ala Tyr Pro Asn Ile
 145 150 155 160
 Gln Asn Leu Phe Gly Glu Leu Arg Ile Glu Asp Arg Leu Gln Trp Lys
 165 170 175
 Glu His Ser Met Ile Phe Ala Met Pro Asn Lys Pro Gly Glu Phe Ser
 180 185 190
 30 Arg Phe Asp Phe Pro Glu Thr Leu Pro Ala Pro Ile Asn Gly Ile Trp
 195 200 205
 Ala Ile Leu Arg Asn Asn Glu Met Leu Thr Trp Pro Glu Lys Val Lys
 210 215 220
 35 Phe Ala Ile Gly Leu Leu Pro Ala Met Val Gly Gly Gln Pro Tyr Val
 225 230 235 240
 Glu Ala Gln Asp Gly Leu Thr Val Ser Glu Trp Met Lys Lys Gln Gly
 245 250 255
 Val Pro Asp Arg Val Asn Asp Glu Val Phe Ile Ala Met Ser Lys Ala
 260 265 270
 40 Leu Asn Phe Ile Asn Pro Asp Glu Leu Ser Met Gln Cys Ile Leu Ile
 275 280 285
 Ala Leu Asn Arg Phe Leu Gln Glu Lys His Gly Ser Lys Met Ala Phe
 290 295 300
 45 Leu Asp Gly Asn Pro Pro Glu Arg Leu Cys Met Pro Ile Val Asp His
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 325 330 335
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 50 Gly Thr Gln Ile Thr Gly Asp Ala Tyr Val Cys Ala Thr Pro Val Asp
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 55 Lys Lys Leu Glu Lys Leu Val Gly Val Pro Val Ile Asn Val His Ile
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 Trp Phe Asp Arg Lys Leu Asn Asn Thr Tyr Asp His Leu Leu Phe Ser

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 5 Glu Tyr Tyr Asp Pro Asn Arg Ser Met Leu Glu Leu Val Phe Ala Pro
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 Ala Asp Glu Trp Ile Gly Arg Ser Asp Thr Glu Ile Ile Asp Ala Thr
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 Met Glu Glu Leu Ala Lys Leu Phe Pro Asp Glu Ile Ala Ala Asp Gln
 465 470 475 480
 10 Ser Lys Ala Lys Ile Leu Lys Tyr His Ile Val Lys Thr Pro Arg Ser
 485 490 495
 Val Tyr Lys Thr Val Pro Asn Cys Glu Pro Cys Arg Pro Leu Gln Arg
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 Tyr Leu Ala Ser Met Glu Gly Ala Val Leu Ser Gly Lys Leu Cys Ala
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 97
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 Val Ser Phe Gly Val Lys Ser Leu Val Leu Arg Asn Lys Gly Lys Arg
 35 40 45

50 ttc cgt cgg agg ctc ggt gct cta cag gtt gtt tgc cag gac ttt cca
 193
 Phe Arg Arg Arg Leu Gly Ala Leu Gln Val Val Cys Gln Asp Phe Pro
 50 55 60

55 aga cct cca cta gaa aac aca ata aac ttt ttg gaa gct gga caa cta
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	80					85					90					95
10	gtg	att	gct	gga	gca	gga	tta	gct	ggg	tta	tca	acg	gca	aaa	tat	ctg
	337															
	Val	Ile	Ala	Gly	Ala	Gly	Leu	Ala	Gly	Leu	Ser	Thr	Ala	Lys	Tyr	Leu
					100					105					110	
15	gca	gat	gct	ggg	cat	aaa	ccc	ata	ttg	ctt	gag	gca	agg	gat	gtt	ttg
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	Ala	Asp	Ala	Gly	His	Lys	Pro	Ile	Leu	Leu	Glu	Ala	Arg	Asp	Val	Leu
				115					120					125		
20	ggg	gga	aag	ata	gct	gct	tgg	aag	gat	gaa	gat	gga	gat	tgg	tat	gaa
	433															
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			130					135					140			
25	act	ggg	ctt	cat	atc	ttt	ttt	gga	gct	tat	ccc	aac	ata	cag	aac	ttg
	481															
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	529															
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	160					165					170					175
35	atg	ata	ttt	gcc	atg	cca	aac	aag	cca	gga	gaa	tcc	agc	cgg	ttt	gat
	577															
	Met	Ile	Phe	Ala	Met	Pro	Asn	Lys	Pro	Gly	Glu	Ser	Ser	Arg	Phe	Asp
					180					185					190	
40	ttt	cct	gaa	aca	ttg	cct	gca	ccc	tta	aat	gga	ata	tgg	gcc	ata	cta
	625															
	Phe	Pro	Glu	Thr	Leu	Pro	Ala	Pro	Leu	Asn	Gly	Ile	Trp	Ala	Ile	Leu
				195					200					205		
45	aga	aac	aat	gaa	atg	cta	act	tgg	cca	gag	aag	gtg	aag	ttt	gct	ctt
	673															
	Arg	Asn	Asn	Glu	Met	Leu	Thr	Trp	Pro	Glu	Lys	Val	Lys	Phe	Ala	Leu
		210						215					220			
50	gga	ctt	ttg	cca	gca	atg	gtt	ggg	ggc	caa	gct	tat	gtt	gaa	gct	caa
	721															
	Gly	Leu	Leu	Pro	Ala	Met	Val	Gly	Gly	Gln	Ala	Tyr	Val	Glu	Ala	Gln
		225					230					235				
55	gat	ggg	ttt	act	gtt	tct	gag	tgg	atg	aaa	aag	cag	ggg	gtt	cct	gat
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				260			265 270
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10	Ile	Asn	Pro	Asp	Glu	Leu	Ser Met Gln Cys Ile Leu Ile Ala Leu Asn
				275			280 285
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	913						
15	Arg	Phe	Leu	Gln	Glu	Lys	His Gly Ser Lys Met Ala Phe Leu Asp Gly
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	320					325	330 335
	aat	cct	gat	gga	aca	gtg	aaa cac ttt gca ctt acc gat gga act caa
	1057						
30	Asn	Pro	Asp	Gly	Thr	Val	Lys His Phe Ala Leu Thr Asp Gly Thr Gln
					340		345 350
	ata	act	gga	gat	gct	tat	gtt ttt gca aca cca gtt gat atc ttg aag
	1105						
35	Ile	Thr	Gly	Asp	Ala	Tyr	Val Phe Ala Thr Pro Val Asp Ile Leu Lys
				355			360 365
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	1201						
45	Glu	Lys	Leu	Val	Gly	Val	Pro Val Ile Asn Val His Ile Trp Phe Asp
		385					390 395
	aga	aaa	ctg	aag	aac	aca	tat gac cac ctt ctt ttc agc agg agt tca
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	ctt	tta	agt	gtt	tat	gcg	gac atg tca gta act tgc aag gaa tac tat
	1297						
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					420		425 430

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 10 Trp Val Gly Arg Ser Asp Thr Glu Ile Ile Glu Ala Thr Met Gln Glu
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 15 Leu Ala Lys Leu Phe Pro Asp Glu Ile Ala Ala Asp Gln Ser Lys Ala
 465 470 475
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 1489
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 1585
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 1681
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35 40 45
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50 55 60
Pro Pro Leu Glu Asn Thr Ile Asn Phe Leu Glu Ala Gly Gln Leu Ser
65 70 75 80
Ser Phe Phe Arg Asn Ser Glu Gln Pro Thr Lys Pro Leu Gln Val Val
25 85 90 95
Ile Ala Gly Ala Gly Leu Ala Gly Leu Ser Thr Ala Lys Tyr Leu Ala
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Asp Ala Gly His Lys Pro Ile Leu Leu Glu Ala Arg Asp Val Leu Gly
115 120 125
30 Gly Lys Ile Ala Ala Trp Lys Asp Glu Asp Gly Asp Trp Tyr Glu Thr
130 135 140
Gly Leu His Ile Phe Phe Gly Ala Tyr Pro Asn Ile Gln Asn Leu Phe
145 150 155 160
Gly Glu Leu Gly Ile Asn Asp Arg Leu Gln Trp Lys Glu His Ser Met
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Pro Glu Thr Leu Pro Ala Pro Leu Asn Gly Ile Trp Ala Ile Leu Arg
195 200 205
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Leu Leu Pro Ala Met Val Gly Gly Gln Ala Tyr Val Glu Ala Gln Asp
225 230 235 240
Gly Phe Thr Val Ser Glu Trp Met Lys Lys Gln Gly Val Pro Asp Arg
45 245 250 255
Val Asn Asp Glu Val Phe Ile Ala Met Ser Lys Ala Leu Asn Phe Ile
260 265 270
Asn Pro Asp Glu Leu Ser Met Gln Cys Ile Leu Ile Ala Leu Asn Arg
275 280 285
50 Phe Leu Gln Glu Lys His Gly Ser Lys Met Ala Phe Leu Asp Gly Asn
290 295 300
Pro Pro Glu Arg Leu Cys Met Pro Ile Val Asp His Val Arg Ser Leu
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Gly Gly Glu Val Arg Leu Asn Ser Arg Ile Gln Lys Ile Glu Leu Asn
55 325 330 335
Pro Asp Gly Thr Val Lys His Phe Ala Leu Thr Asp Gly Thr Gln Ile

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